CLAIMS

1-6. (canceled)

7. (currently amended) In an optical network comprising an optical splitter connected to (1) a working optical subscriber unit (OSU) of a working circuit via a working optical fiber, (2) a protection OSU of a protection circuit via a protection optical fiber, and (3) one or more optical network terminals (ONTs), a method for enabling fast protection switching from the working OSU to the protection OSU, comprising the steps of:

(a) synchronizing the working and protection OSUs;

(b) initiating a cell delineation procedure at the protection OSU during normal, non-ranging operations of the working OSU to enable the protection OSU to correctly delineate upstream cells;

(c) measuring arrival times of corresponding upstream cells at both the working and protection OSUs; and

(d) generating a propagation delay value based on the arrival times for use by the protection OSU for communications with the one or more ONTs if and when protection switching is implemented upon detection of a failure in the working circuit, wherein the optical network further comprises:

one or more additional working OSUs, each connected via an additional working optical fiber to an additional optical splitter, which is further connected to one or more additional ONTs; and

an optical switch connected to each of the optical splitters via a protection optical fiber and to the protection OSU, wherein the optical switch is controlled to sequentially connect the protection OSU to each of the optical splitters to implement steps (a) through (d) to generate a different propagation delay value for each working OSU for use by the protection OSU in ranging the one or more ONTs corresponding to a particular working OSU if and when protection switching is implemented upon detection of a failure in the working circuit corresponding to the particular working OSU.

8. (original) The invention of claim 7, wherein the optical splitter is a passive optical splitter and the optical network conforms to ITU-T Recommendation G.983.1.

9. (canceled)

10. (original) The invention of claim 7, wherein the corresponding upstream cells are upstream PLOAM cells that are not associated with ranging by the working OSU.

11. (original) The invention of claim 7, wherein the propagation delay value is generated taking into account differences in upstream and downstream transmission speeds that result from different upstream and downstream transmission wavelengths.

12. (previously presented) The invention of claim 7, wherein the protection OSU is added to the optical network after the working OSU has completed ranging for the one or more ONTs.

13. (original) The invention of claim 7, wherein the cell delineation procedure is implemented using a state machine comprising:

(A) a hunt state wherein different timing positions are used for different BMR reset pulses;

(B) a presync state wherein a single timing position is used for different BMR reset pulses; and

(C) a sync state wherein a single timing position is used for different BMR reset pulses, wherein:

(i) a state transition from the hunt state to the presync state occurs as soon as a first specified number of valid sets of data are identified;

(ii) a state transition from the presync state to the hunt state occurs as soon as a second specified number of invalid sets of data are identified;

(iii) a state transition from the presync state to the sync state occurs after a third specified number of consecutive valid sets of data are identified; and

(iv) a state transition from the sync state to the hunt state occurs after a fourth specified number of consecutive invalid sets of data are identified.

14. (original) The invention of claim 13, wherein the first and second specified numbers are both 1.

15. (original) The invention of claim 7, wherein ranging is not required to be performed by the protection OSU after the protection switching in order to support the communications with the one or more ONTs.

16. (original) The invention of claim 7, wherein step (a) comprises the step of synchronizing frame counters at both the working and protection OSUs.

17. (currently amended) A machine-readable medium, having encoded thereon program code, wherein, when the program code is executed by a machine, the machine implements, in an optical network comprising an optical splitter connected to (1) a working optical subscriber unit (OSU) of a working circuit via a working optical fiber, (2) a protection OSU of a protection circuit via a protection optical fiber, and (3) one or more optical network terminals (ONTs), a method for enabling fast protection switching from the working OSU to the protection OSU, comprising the steps of:

(a) synchronizing the working and protection OSUs;

(b) initiating a cell delineation procedure at the protection OSU during normal, non-ranging operations of the working OSU to enable the protection OSU to correctly delineate upstream cells;

(c) measuring arrival times of corresponding upstream cells at both the working and protection OSUs; and

(d) generating a propagation delay value based on the arrival times for use by the protection OSU for communications with the one or more ONTs if and when protection switching is implemented upon detection of a failure in the working circuit, wherein the optical network further comprises:

one or more additional working OSUs, each connected via an additional working optical fiber to an additional optical splitter, which is further connected to one or more additional ONTs; and

an optical switch connected to each of the optical splitters via a protection optical fiber and to the protection OSU, wherein the optical switch is controlled to sequentially connect the protection OSU to each of the optical splitters to implement steps (a) through (d) to generate a different propagation delay value for each working OSU for use by the protection OSU in ranging the one or more ONTs corresponding to a particular working OSU if and when protection switching is implemented upon detection of a failure in the working circuit corresponding to the particular working OSU.

18. (previously presented) The invention of claim 17, wherein the optical splitter is a passive optical splitter and the optical network conforms to ITU-T Recommendation G.983.1.

19. (canceled)

20. (previously presented) The invention of claim 17, wherein the corresponding upstream cells are upstream PLOAM cells that are not associated with ranging by the working OSU.

21. (previously presented) The invention of claim 17, wherein the propagation delay value is generated taking into account differences in upstream and downstream transmission speeds that result from different upstream and downstream transmission wavelengths.

22. (previously presented) The invention of claim 17, wherein the protection OSU is added to the optical network after the working OSU has completed ranging for the one or more ONTs.

23. (previously presented) The invention of claim 17, wherein the cell delineation procedure is implemented using a state machine comprising:

(A) a hunt state wherein different timing positions are used for different BMR reset pulses;

(B) a presync state wherein a single timing position is used for different BMR reset pulses; and

(C) a sync state wherein a single timing position is used for different BMR reset pulses, wherein:

(i) a state transition from the hunt state to the presync state occurs as soon as a first specified number of valid sets of data are identified;

(ii) a state transition from the presync state to the hunt state occurs as soon as a second specified number of invalid sets of data are identified;

(iii) a state transition from the presync state to the sync state occurs after a third specified number of consecutive valid sets of data are identified; and

(iv) a state transition from the sync state to the hunt state occurs after a fourth specified number of consecutive invalid sets of data are identified.

24. (previously presented) The invention of claim 23, wherein the first and second specified numbers are both 1.

25. (previously presented) The invention of claim 17, wherein ranging is not required to be performed by the protection OSU after the protection switching in order to support the communications with the one or more ONTs.

26. (previously presented) The invention of claim 17, wherein step (a) comprises the step of synchronizing frame counters at both the working and protection OSUs.

27. (new) In an optical network comprising an optical splitter connected to (1) a working optical subscriber unit (OSU) of a working circuit via a working optical fiber, (2) a protection OSU of a protection circuit via a protection optical fiber, and (3) one or more optical network terminals (ONTs), a method for enabling fast protection switching from the working OSU to the protection OSU, comprising the steps of:

(a) synchronizing the working and protection OSUs;

(b) initiating a cell delineation procedure at the protection OSU during normal, non-ranging operations of the working OSU to enable the protection OSU to correctly delineate upstream cells;

(c) measuring arrival times of corresponding upstream cells at both the working and protection OSUs; and

(d) generating a propagation delay value based on the arrival times for use by the protection OSU for communications with the one or more ONTs if and when protection switching is implemented upon detection of a failure in the working circuit, wherein the cell delineation procedure is implemented using a state machine comprising:

(A) a hunt state wherein different timing positions are used for different BMR reset pulses;

(B) a presync state wherein a single timing position is used for different BMR reset pulses; and

(C) a sync state wherein a single timing position is used for different BMR reset pulses, wherein:

(i) a state transition from the hunt state to the presync state occurs as soon as a first specified number of valid sets of data are identified;

(ii) a state transition from the presync state to the hunt state occurs as soon as a second specified number of invalid sets of data are identified;

(iii) a state transition from the presync state to the sync state occurs after a third specified number of consecutive valid sets of data are identified; and

(iv) a state transition from the sync state to the hunt state occurs after a fourth specified number of consecutive invalid sets of data are identified.

28. (new) The invention of claim 27, wherein the first and second specified numbers are both 1.

29. (new) A machine-readable medium, having encoded thereon program code, wherein, when the program code is executed by a machine, the machine implements, in an optical network comprising an optical splitter connected to (1) a working optical subscriber unit (OSU) of a working circuit via a working optical fiber, (2) a protection OSU of a protection circuit via a protection optical fiber, and (3) one or more optical network terminals (ONTs), a method for enabling fast protection switching from the working OSU to the protection OSU, comprising the steps of:

(a) synchronizing the working and protection OSUs;

(b) initiating a cell delineation procedure at the protection OSU during normal, non-ranging operations of the working OSU to enable the protection OSU to correctly delineate upstream cells;

(c) measuring arrival times of corresponding upstream cells at both the working and protection OSUs; and

(d) generating a propagation delay value based on the arrival times for use by the protection OSU for communications with the one or more ONTs if and when protection switching is implemented upon detection of a failure in the working circuit, wherein the cell delineation procedure is implemented using a state machine comprising:

(A) a hunt state wherein different timing positions are used for different BMR reset pulses;

(B) a presync state wherein a single timing position is used for different BMR reset pulses; and

(C) a sync state wherein a single timing position is used for different BMR reset pulses, wherein:

(i) a state transition from the hunt state to the presync state occurs as soon as a first specified number of valid sets of data are identified;

(ii) a state transition from the presync state to the hunt state occurs as soon as a second specified number of invalid sets of data are identified;

(iii) a state transition from the presync state to the sync state occurs after a third specified number of consecutive valid sets of data are identified; and

(iv) a state transition from the sync state to the hunt state occurs after a fourth specified number of consecutive invalid sets of data are identified.

30. (new) The invention of claim 29, wherein the first and second specified numbers are both 1.